CLAIMS

1. A composite drive system for a compressor, comprising:

an input means receiving power from a prime mover constituting a main drive source;

a dynamotor capable of operating as selected one of a motor and a generator, including an armature portion capable of being rotated and a field portion surrounding said armature portion and supported to rotate independently of said armature portion;

a compressor having a drive shaft for compressing a fluid when said drive shaft is rotationally driven;

a power supply unit capable of supplying power to said dynamotor and capable of receiving the power supplied from said dynamotor;

a power control unit incorporated in an electrical circuit for connecting said power supply unit and said dynamotor;

means for mechanically interlocking a selected one of the armature portion and the field portion of said dynamotor with said input means; and

means for mechanically interlocking the other one of the armature portion and the field portion of said dynamotor with the drive shaft of said compressor.

2. A composite drive system for a compressor according to claim 1, wherein at least one permanent magnet is mounted on selected one of the field portion and the armature portion, wherein an iron core having a plurality of coils is mounted on the other one of said field portion and the armature portion, and wherein a plurality of said coils are each energized thereby to form a rotary magnetic field in said iron core.

3. A composite drive system for a compressor according to claim 1, wherein in order to stop said compressor and reduce the discharge capacity of said

compressor to zero, the electrical circuit connecting said dynamotor and said power supply unit is turned off by said power control unit to thereby reduce to zero the amount of the current flowing between said dynamotor and said power supply unit.

4. A composite drive system for a compressor according to claim 1, wherein said dynamotor operates in selected one of motor mode and unloaded operation mode when said prime mover is stationary, and wherein said dynamotor operates in selected one of motor mode, generator mode and unloaded operation mode when said prime mover is in operation.

5. A composite drive system for a compressor according to claim 1 wherein, in order to control the discharge capacity per unit time of said compressor by controlling the rotational speed of the drive shaft of said compressor, the generator mode for supplying power to said power supply unit from said dynamotor is selected and the prevailing current amount is controlled by said power control unit.

6. A composite drive system for a compressor, comprising:

an input means receiving power from a prime mover constituting a main drive source;

a dynamotor capable of operating as selected one of a motor and a generator, including a rotor capable of rotating and having a plurality of permanent magnets arranged on the peripheral surface thereof and an iron core having a plurality of coils and fixed at a position in opposed relation to said rotor;

a compressor having a drive shaft for compressing a fluid when said drive shaft is rotationally driven;

a power supply unit capable of supplying power to said dynamotor and capable of receiving the power supplied from said dynamotor;

a power control unit incorporated in an

electrical circuit for connecting said power supply unit and said dynamotor;

means for mechanically interlocking the rotor of said dynamotor with said input means; and

means for mechanically interlocking the rotor of said dynamotor with the drive shaft of said compressor.

7. A composite drive system for a compressor according to claim 6, wherein said means for mechanically interlocking the rotor of said dynamotor and said input means includes a one-way clutch.

8. A composite drive system for a compressor according to claim 6, wherein said means for mechanically interlocking the rotor of said dynamotor and said input means includes a torque limiter.

9. A composite drive system for a compressor according to claim 6, wherein said means for mechanically interlocking the rotor of said dynamotor and said input means includes a damper for absorbing torque variations.

10. A composite drive system for a compressor according to claim 6, wherein said dynamotor operates in motor mode when said prime mover is stationary, and in generator mode always when said prime mover is in operation.

11. A composite drive system for a compressor according to claim 7, wherein said one-way clutch is arranged in a cylindrical space with one end closed and the other end open, and wherein said open other end is closed by a seal member and grease is sealed in said cylindrical closed space.

12. A composite drive system for a compressor according to claim 6, wherein said dynamotor is covered with a fixed housing.

13. A composite drive system for a compressor according to claim 6, wherein said means for mechanically interlocking the rotor of said dynamotor and said input means includes a pulley for a belt, and wherein said

pulley is rotatably supported through a bearing by the drive shaft of said compressor.

14. A composite drive system for a compressor according to claim 6, wherein said means for mechanically interlocking the rotor of said dynamotor and said input means includes a pulley for a belt, and wherein, in order to support the tension of said belt exerted on said pulley, the housing of said dynamotor fixed to cover said dynamotor supports said pulley on the inside of the same.

15. A composite drive system for a compressor according to claim 14, wherein said housing of said dynamotor is configured to support the bearing of said pulley at the end portion reaching the inside of said dynamotor after covering said dynamotor.

16. A composite drive system for a compressor according to claim 15, wherein said bearing of said pulley is supported on the outer surface of the end portion of said housing.

17. A composite drive system for a compressor according to claim 15, wherein the end of said housing supporting the bearing of said pulley is formed at a portion adapted return rearward after covering said dynamotor from the front side of said dynamotor and protruded forward again.

18. A composite drive system for a compressor according to claim 15, wherein said bearing of said pulley is supported on the inner surface of the end portion of said housing.

19. A composite drive system for a compressor according to claim 15, wherein the end portion of said housing supporting the bearing of said pulley is formed at a portion adapted to return rearward after covering said dynamotor from the front portion thereof.

20. A composite drive system for a compressor according to claim 6, wherein said rotor having a plurality of said permanent magnets is so shaped that the housing which covers said dynamotor from the front

portion thereof and then circumvents rearward is covered by said rotor from the rear portion of said housing.

21. A composite drive system for a compressor according to claim 12, wherein a connector for supplying power to said dynamotor is mounted on the housing of said dynamotor.

22. A composite drive system for a compressor according to claim 12, wherein an end portion of said housing of said dynamotor is fitted on a part of said housing of said compressor and fixed by fastening means.

23. A composite drive system for a compressor according to claim 9, wherein said means for mechanically interlocking said rotor of said dynamotor and said input means includes a dish-shaped hub supported on said rotor through a bearing, and wherein the axial position of said hub is determined by means for setting said bearing in position on said rotor.

24. A composite drive system for a compressor according to claim 9, wherein said means for mechanically interlocking said rotor of said dynamotor and said input means includes a dish-shaped hub supported on said rotor through a bearing, and wherein said hub is stopped through said bearing by means mounted at the end portion of said rotor.

25. A composite drive system for a compressor according to claim 1, wherein said prime mover is an internal combustion engine mounted on a vehicle.

26. A composite drive system for a compressor according to claim 1, wherein said compressor is of fixed replacement type having a predetermined discharge capacity per rotation of said drive shaft.

27. A composite drive system for a compressor according to claim 1, wherein said compressor is used as a refrigerant compressor of an air-conditioning system of a vehicle.

28. A composite drive system for a compressor according to claim 1, wherein said power supply unit is a

battery mounted on a vehicle.

29. A composite drive system for a compressor according to claim 1, wherein in order to control the discharge capacity per unit time by controlling the rotational speed of the drive shaft of said compressor, the motor mode for supplying power to said dynamotor from said power supply unit is selected and the prevailing current amount is controlled by said power control unit.

30. A composite drive system for a compressor according to claim 5, wherein the current amount is controlled by the duty factor control operation performed by said power control unit.

31. A composite drive system for a compressor according to claim 29, wherein the current amount is controlled by the duty factor control operation performed by said power control unit.

32. A composite drive system for a compressor according to claim 1, wherein said dynamotor is incorporated in the pulley as said input means rotationally driven through a belt from the output shaft of said prime mover.

33. A composite drive system for a compressor according to claim 1, wherein said dynamotor is mounted as a main generator on a vehicle.

34. A composite drive system for a compressor according to claim 1, wherein said prime mover is an internal combustion engine and subjected to idle-stop control.